

2-2017

Risk Assessment in Criminal Justice

Kris Henning
Portland State University

Ryan M. Labrecque
Portland State University, rml@pdx.edu

Let us know how access to this document benefits you.

Follow this and additional works at: http://pdxscholar.library.pdx.edu/ccj_fac



Part of the [Criminology and Criminal Justice Commons](#)

Citation Details

Henning, K., & Labrecque, R. M. Risk Assessment in Criminal Justice. Presented in February at the Justice Reinvestment Summit in Salem, OR, 2017.

This Presentation is brought to you for free and open access. It has been accepted for inclusion in Criminology and Criminal Justice Faculty Publications and Presentations by an authorized administrator of PDXScholar. For more information, please contact pdxscholar@pdx.edu.

Introduction to Risk Assessment for Criminal Justice Administrators

Kris Henning, Ph.D.

Ryan M. Labrecque, Ph.D.

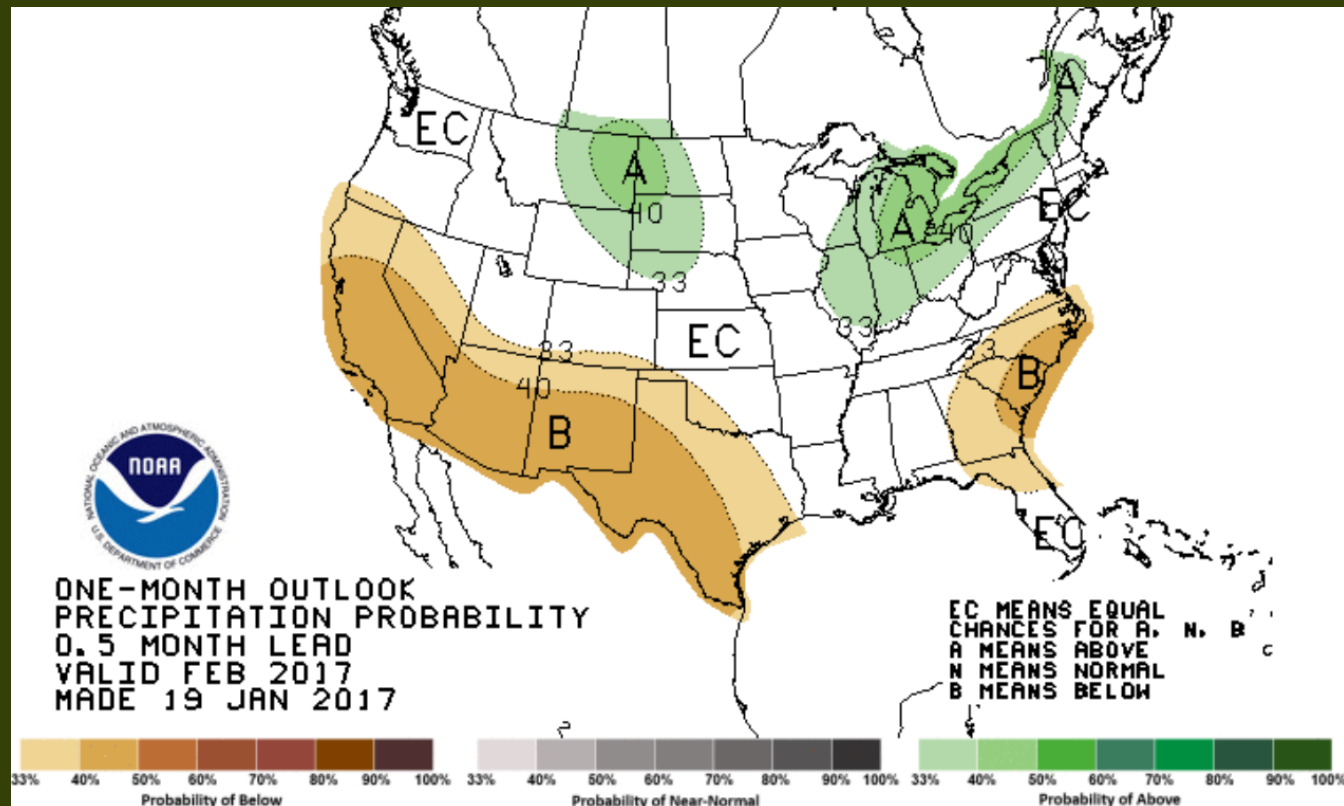
Portland State University

Today's Agenda

- What is risk assessment?
- Why do we need risk assessments in CJ?
- How **are** risk assessments done in CJ?
- How **should** risk assessments be done in CJ?
- How are risk scales developed?
- How are risk scales evaluated?
- How do you choose a risk assessment scale for your agency?

Weather Forecasting

Attempt to identify the probability that a given area will experience a specific type of weather within a defined timeframe



What is Risk Assessment?

*Attempt to identify the probability that a given individual will engage in a specific antisocial behavior within a defined follow-up period**







* Definition suggested by Stephen Hart

What is Risk Assessment?

Attempt to identify the probability that a given individual will engage in a specific antisocial behavior within a defined follow-up period

- Errors will always occur – false positives & false negatives
- Goal is to find and use methods that minimize errors (improvement over current practices)

<u>Prediction</u>	<u>Outcome</u>	
	Not Violent	Violent
Low Risk		
High Risk		

What is Risk Assessment?

*Attempt to identify the **probability** that a given individual will engage in a specific antisocial behavior within a defined follow-up period*

- Barefoot v. Estelle (1983)
 - There is a “100% and absolute chance” that Mr. Barefoot would commit future acts of criminal violence (Dr. Grigson)
- Human behavior too complex for absolute predictions



What is Risk Assessment?

*Attempt to identify the probability that a given individual will engage in a **specific antisocial behavior** within a defined follow-up period*

- New violent crime
- New DV offense
- Any new arrest
- Failure to appear

Should be tailored to prediction of a specific outcome

Outcome of interest varies by CJ agency and goals

What is Risk Assessment?

*Attempt to identify the probability that a given individual will engage in a specific antisocial behavior within a defined **follow-up period***

- 6 months
- 3 years
- 5 years
- 10 years

Timeframe varies by
agency and goals of risk
assessment

(we are better at near predictions
than farther away in time)

What is Risk Assessment?

Needs Assessment: *Attempt to identify the dynamic or changeable factors in a person's life that may be causally linked to his/her risk for recidivism*

- Education & employment
- Housing
- Mental health
- Peer associations
- Family relationships
- Attitudes
- Leisure activities
- Alcohol & drug use

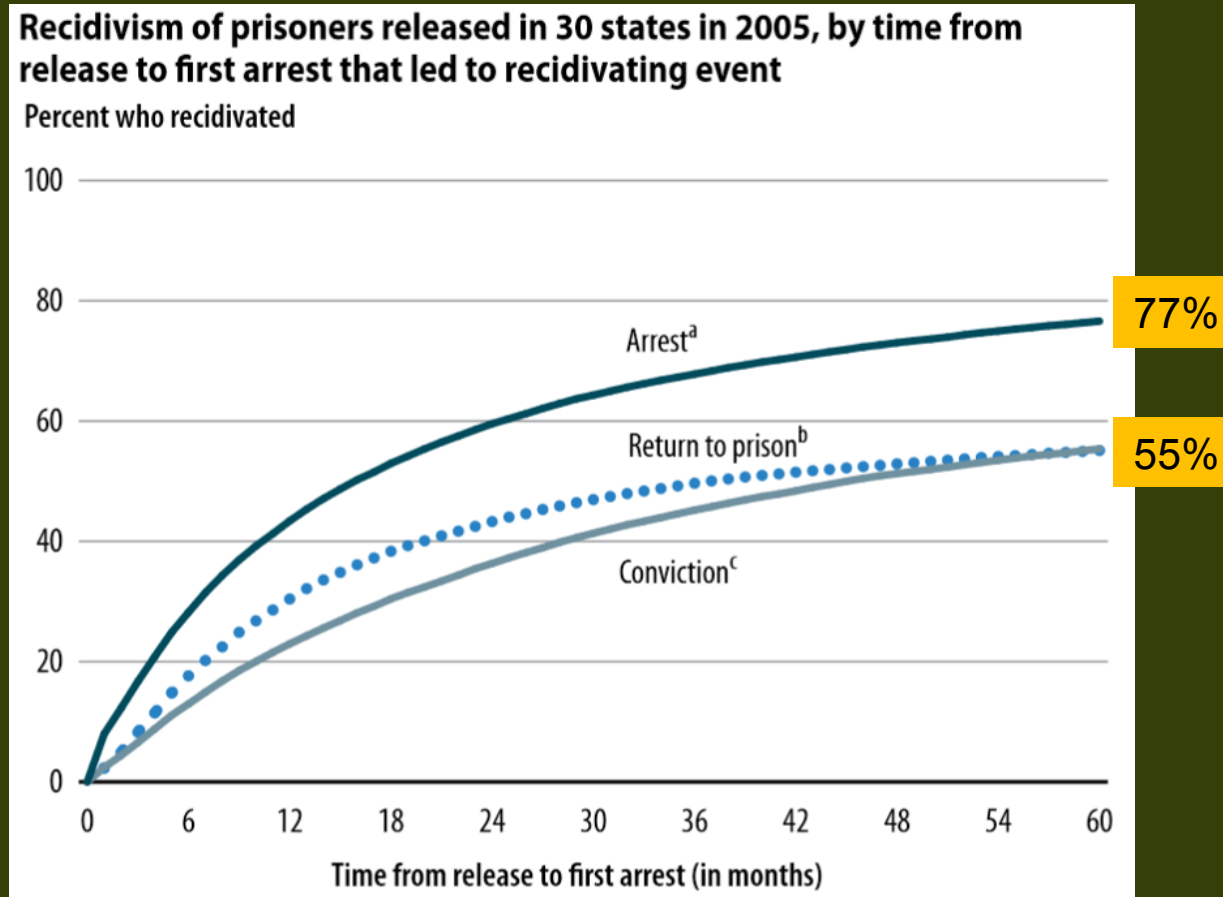
What is Risk Assessment?

Risk Management: *Development and implementation of a plan to reduce a person's risk for recidivism (i.e., address need areas)*

- Restrictions (e.g., people, locations, firearms)
- Expectations (e.g., maintain employment, education)
- Supervision (e.g., frequency, home visits)
- Monitoring (e.g., random drug/alcohol testing, GPS)
- Treatment (e.g., BIP, sex offender group)

Why Do We Need Risk Assessments?

■ Recidivism happens.....a lot



BJS (2014) study with 30 states and 404,638 inmates released from prison in 2005

Why Do We Need Risk Assessments?

- Efforts to reduce recidivism are significantly more effective when we attend to risk (Bonta & Andrews, 2017)
- Prioritize resources for highest **risk** offenders
 - Focus efforts on changing dynamic **risk factors** (needs) linked to crime & recidivism
 - Use responsive treatment approaches that are proven to reduce **risk** for recidivism (e.g., behavioral and cognitive-behavioral interventions)
- 33% lower recidivism from programs that adhere to principles of RNR (Dowden & Andrews, 2006)

Why Do We Need Risk Assessments?

- Mandated by law

- ORS 133.055 - *“Identify primary DV aggressor based on the potential for future assaults”*
- HB 3194 – *“The standards must: (A) Be designed to reduce recidivism in a cost-effective manner; and (B) When appropriate, target medium-risk and high-risk offenders.”*

Why Do We Need Risk Assessments?

- Central to agency's core function
 - Pretrial Detention - *"If, after a hearing and the presentment of an indictment or a showing of probable cause in the charged offense, the government proves by clear and convincing evidence that no condition or combination of conditions of release will reasonably ensure the defendant's appearance in court or **protect the safety of the community or any person**, the judicial officer should order the detention of the defendant before trial."*

American Bar Association Pretrial Standards (<http://www.americanbar.org>)

Why Do We Need Risk Assessments?

- Legitimacy of criminal justice system is enhanced when we:
 - Makes **consistent/reliable** decisions
 - Makes **accurate** decisions
 - Makes **unbiased** decisions
 - Makes **timely** decisions
 - Use resources **efficiently**
- Risk assessment, when done well, can help achieve these goals

How Are Risk Assessments Done in CJ?

“Prediction of future criminal conduct is an essential element in many of the decisions rendered throughout our criminal justice system”

Justices Stewart, Powell, and Stevens
in *Jurek v. Texas*, 428 U.S. 262 (1976)

Role – Agency	Decision(s) Made in Part Based on Perceived Risk
Victim	Report crime to police; Seek shelter; Leave relationship
Dispatcher	Send officer to scene
Officer	Call for backup; Use force; Arrest vs. citation in lieu
Pretrial	Release vs. detain; Conditions of release
Jail	Custody level
Prosecutor	Charge vs. dismiss case; Plea offer
Judge	Community sanction vs. incarceration; Conditions
Corrections	Custody level; Release conditions; Comm. supervision

How Are Risk Assessments Done in CJ?

- Index Crime Severity
 - Felony > Misd.
 - Use of weapon
 - Injury to victim
 - More serious index crime = greater risk

How Are Risk Assessments Done in CJ?

- Index Crime Severity
 - Felony > Misd.
 - Use of weapon
 - Injury to victim
 - More serious index crime ≠ greater risk

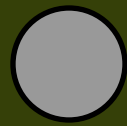
Bonta, Law & Hanson (1998) meta-analysis with 64 studies of mentally disordered offenders

General Recidivism		Violent Recidivism	
Objective risk assessment	.39	Objective risk assessment	.30
Adult criminal history	.23	Employment problems	.22
Juvenile delinquency	.22	Juvenile delinquency	.20
Mentally disordered offender	-.19	Family problems	.19
Antisocial personality	.18	Antisocial personality	.18
Nonviolent criminal history	.18	Age	-.18
Homicide index offense	-.17	Hospital admissions	.17
Age	-.15	Violent history	.16
Institutional adjustment	.13	Adult criminal history	.14
Hospital admissions	.12	Institutional adjustment	.14
Poor living arrangements	.12	Nonviolent criminal history	.13
Gender (male)	.11	Marital status (single)	.13
Substance abuse (any)	.11	Weapon	.12
Family problems	.10	Mentally disordered offender	-.10
Escape history	.10	Days hospitalized	-.09
Violent history	.10	Clinical judgment	.09
Violent index^a	-.10	Race (minority)	.09
Drug abuse	.09	Substance abuse (any)	.08
Sex offense	-.08	Violent index^a	.08
Marital status (single)	.07	NGRI	-.07
Weapon	.07	Offense seriousness^b	.06
NGRI	-.07	Sex offense	.04
Days hospitalized	.06	Psychosis	-.04
Alcohol abuse	.06	Education	-.02
Psychosis	-.05	Intelligence	-.02
Mood disorder	-.04	Mood disorder	.01
Clinical judgment	.03		
Education	.03		
Treatment history	-.03		
Employment problems	.02		
Intelligence	.01		
Race (minority)	-.01		
Offense seriousness^b	-.01		
Socioeconomic status	.00		

^aIncludes offenses with weapon, injury, violence.

^bMisd. vs. felony and misc. severity scales.

How Are Risk Assessments Done in CJ?



Unstructured Professional Judgment

- *“Based on my 12 years of experience in insert from list below I would say this guy will almost certainly be arrested again...”*
 - Law Enforcement
 - Corrections
 - Prosecution
 - Psychiatry/Psychology/Social Work
- Most common form of decision-making in CJ system

How Are Risk Assessments Done in CJ?

Unstructured Professional Judgment

- *“Based on my 12 years of experience in _____ I would say this guy will almost certainly be arrested again.”*

Actuarial Risk Assessment

- Statistical formulas that combine “risk factors” to maximize accuracy of predicting a targeted outcome (e.g., recidivism)

How Are Risk Assessments Done in CJ?

Actuarial Prediction of Life Expectancy

My Summary:

Male

51 Years Old

White

6' 1"

210 lb

College Graduate

Married

5+ Workouts Per Week

Excellent Health

Zero

Non-Smoker

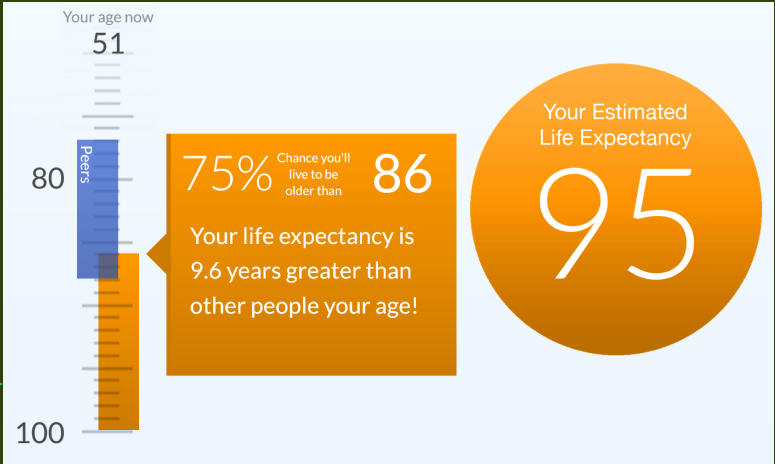
No Diabetes

> \$80K

CALCULATE

My Life Expectancy

Factors associated with life expectancy

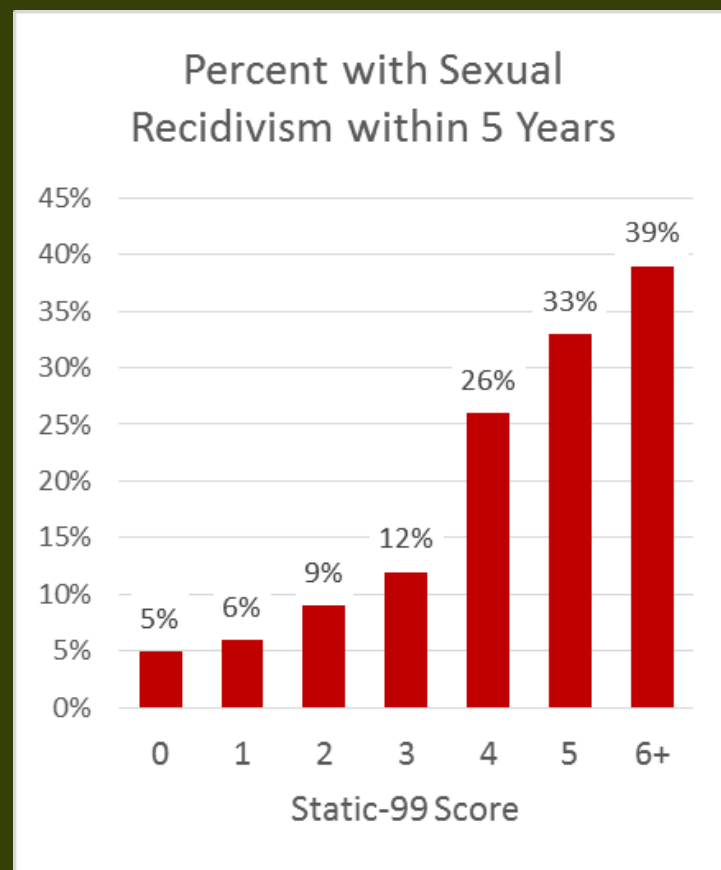


Based on data from 500,000 people (<https://www.myabaris.com/tools/life-expectancy-calculator-how-long-will-i-live/>)

How Are Risk Assessments Done in CJ?

Question Number	Risk Factor	Codes	Score										
1	Young (S9909)	Aged 25 or older Aged 18 – 24.99	0 1										
2	Ever Lived With (S9910)	Ever lived with lover for at least two years? Yes No	0 1										
3	Index non-sexual violence - Any Convictions (S9904)	No Yes	0 1										
4	Prior non-sexual violence - Any Convictions (S9905)	No Yes	0 1										
5	Prior Sex Offences (S9901)	<table><tr><th>Charges</th><th>Convictions</th></tr><tr><td>None</td><td>None</td></tr><tr><td>1-2</td><td>1</td></tr><tr><td>3-5</td><td>2-3</td></tr><tr><td>6+</td><td>4+</td></tr></table>	Charges	Convictions	None	None	1-2	1	3-5	2-3	6+	4+	0 1 2 3
Charges	Convictions												
None	None												
1-2	1												
3-5	2-3												
6+	4+												
6	Prior sentencing dates (excluding index) (S9902)	3 or less 4 or more	0 1										
7	Any convictions for non-contact sex offences (S9903)	No Yes	0 1										
8	Any Unrelated Victims (S9906)	No Yes	0 1										
9	Any Stranger Victims (S9907)	No Yes	0 1										
10	Any Male Victims (S9908)	No Yes	0 1										
	Total Score	Add up scores from individual risk factors											

Hanson's Static-99 for recidivism by sex offenders



How Are Risk Assessments Done in CJ?

Unstructured Professional Judgment

Structured Professional Judgment

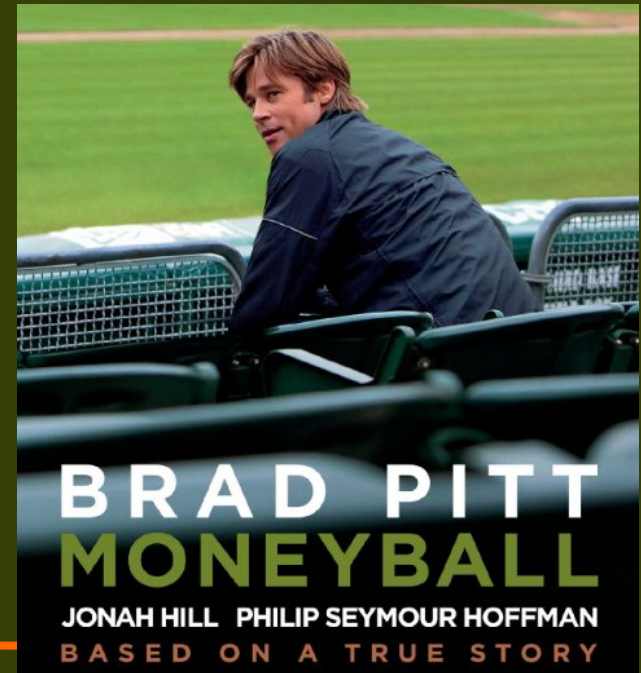
- “Checklist” of risk factors must consider
- Items supported by research and/or theory
- Evaluator has discretion in how items are combined & weighted
- Pilots pre-flight checklist; Surgical checklist



Actuarial Risk Assessment

How Should Risk Assessments Be Done in CJ?

- Statistical (actuarial) methods are more accurate in a broad range of decision-making activities (Grove & Meehl, 1996; Aegisdottir et al., 2006)
 - Violence
 - Academic functioning
 - Job performance
 - Response to medical treatments
 - Sports (Oakland A's)



How Should Risk Assessments Be Done in CJ?

- Problems with unstructured risk assessments
 - **Choice of factors** – overemphasize items that are not reliably associated with recidivism (severity of current offense)
 - **Overconfidence** – people are overconfident in ability to predict; fail to acknowledge, learn from past errors
 - **Poor inter-rater reliability** – 2 people assessing same offender often arrive at different conclusions
 - **Potential bias** – conscious/unconscious bias based on race, ethnicity, gender, SES, etc.

How Should Risk Assessments Be Done in CJ?

“Every day many thousands of predictions are made by parole boards, college admission committees, psychiatric teams, and juries..... To use the less efficient of two prediction procedures in dealing with such matters is not only unscientific and irrational, it is unethical.”

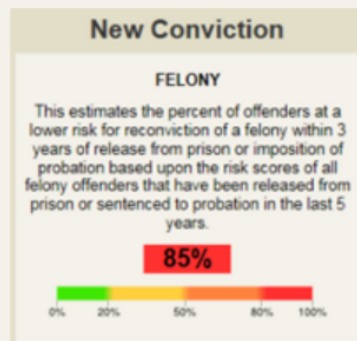
- Grove & Meehl (1996)

How Are Actuarial Risk Scales Developed?

- Public Safety Checklist (PSC) is a fully automated risk assessment scale
 - Used by Oregon's Community Corrections to determine supervision levels
 - Available to CJ professionals through the internet

The Public Safety Checklist for Oregon

How are the risk scores displayed and what do they mean?



SID:

ORS:

To run the Public Safety Checklist (PSC), please enter a person's State Identification Number (SID) and the Oregon Revised Statute of the crime for which he or she is being sentenced (e.g. 165.800 if the person is before the court on a new identity theft case). Please also check if you are a judge, a district attorney or a defense attorney so we will know who is making use of the PSC.

How Are Actuarial Risk Scales Developed?

1. Specify population or group you are trying to make predictions about
 - Offenders released from prison or starting probation term in Oregon
2. Specify what are you trying to predict (outcome)
 - New “person” crime within 5 years of release from prison or start of probation
3. Find sample cases to use in developing new scale
 - 56,047 felony offenders released from prison or starting probation between 2000 and 2005

How Are Actuarial Risk Scales Developed?

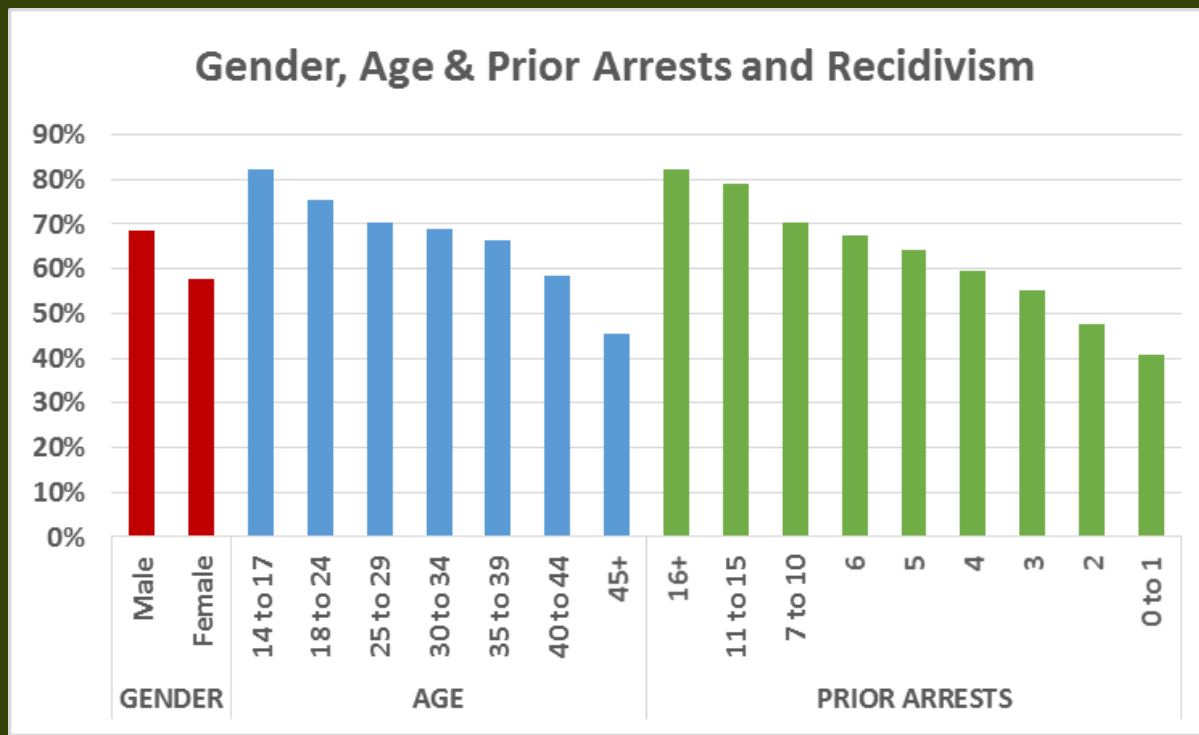
4. Collect information on **possible risk factors** for each case at **time 1** (prison release/start of probation)

Type (new)	Type (old)	Description	Examples
Fixed Risk Marker	Static	Unchangeable	- Gender - Prior felony arrest
Variable Risk Marker	Static	Unchangeable by intervention	- Age
Variable Risk Factor	Dynamic	Changeable by intervention	- Employment status - Neighborhood
Causal Risk Factor	Dynamic	Changeable by intervention & when changed, reduces recidivism	- Antisocial attitude - Antisocial peers - Substance abuse

Categorization proposed by Monahan & Skeem (2016)

How Are Actuarial Risk Scales Developed?

4. Collect information on **possible risk factors** for each case at **time 1** (prison release/start of probation)
 - Prior research



Based on 272,111 inmates released from U.S. state prison in 1994

How Are Actuarial Risk Scales Developed?

4. Collect information on **possible risk factors** on each case at **time 1** (prison release/start of probation)

- Criminal history (e.g., # arrests, age 1st arrest)
- Antisocial peer group/gang involvement
- Antisocial attitudes (e.g. hostile attributions)
- Personality disorder/psychopathy/impulsivity
- Demographics (younger age, male, never married)
- Work history/unemployed
- Family problems (current & family of origin)
- Substance abuse/dependence
- Prior failures on supervised release

*“The
big 4”*

How Are Actuarial Risk Scales Developed?

4. Collect information on **possible risk factors** on each case at **time 1** (prison release/start of probation)

- LEDS – state arrest records
- DOC – Dept. of Corrections files
- OJIN – State's judicial data system

- | | |
|-------------------------------|---------------------------------|
| ➤ age | ➤ prior theft conviction (y/n) |
| ➤ gender | ➤ parole/prob. revocation (y/n) |
| ➤ age of first arrest in LEDS | ➤ prior incarceration (y/n) |
| ➤ severity of current crime | ➤ multiple DOC custodies (y/n) |
| ➤ # prior arrests in LEDS | ➤ sentence (probation/prison) |

How Are Actuarial Risk Scales Developed?

5. Code outcome at end of follow-up time for each case
(time 2)
 - Yes/no for person* arrest in 5 years since release

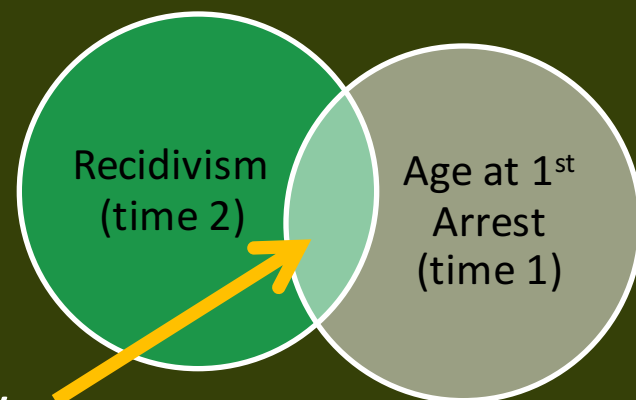
*PARTIAL LIST
813.010 - DRIVE UNDER INFLUENCE INTOX
163.160 - ASSAULT IV
166.065 - HARASSMENT
164.225 - BURGLARY I
163.190 - MENACING
162.315 - RESIST ARREST
163.195 - RECKLESSLY ENDANGER ANOTHER
163.165 - ASSAULT III
163.175 - ASSAULT II
163.187 - STRANGULATION
163.575 - ENDANGER WELFARE OF MINOR
166.220 - WEAPON USE UNLAWFUL
.

How Are Actuarial Risk Scales Developed?

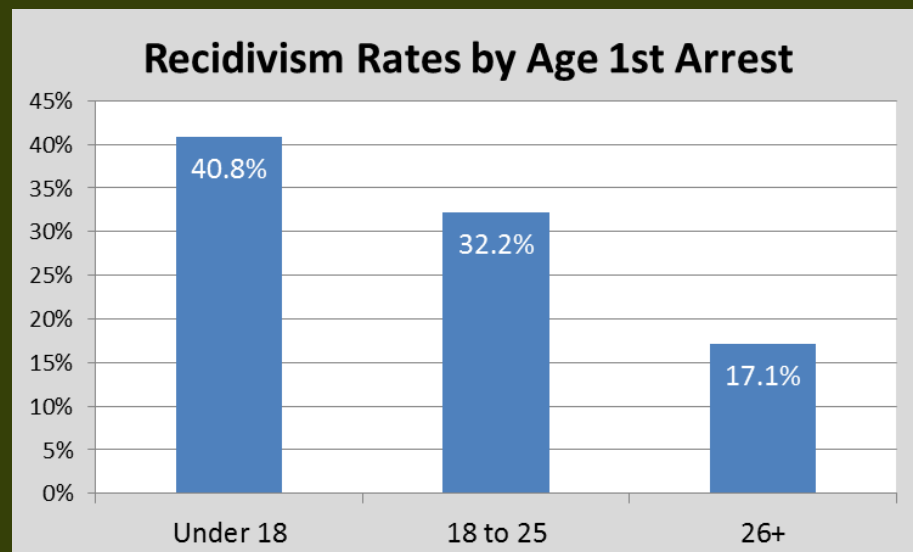
6. Identify individual risk factors that predict outcome (bivariate analyses)

- **Correlation** (range -1 to 1, 0 = no relationship)

-.19 = “younger age at 1st arrest is associated with higher likelihood of new person arrest”

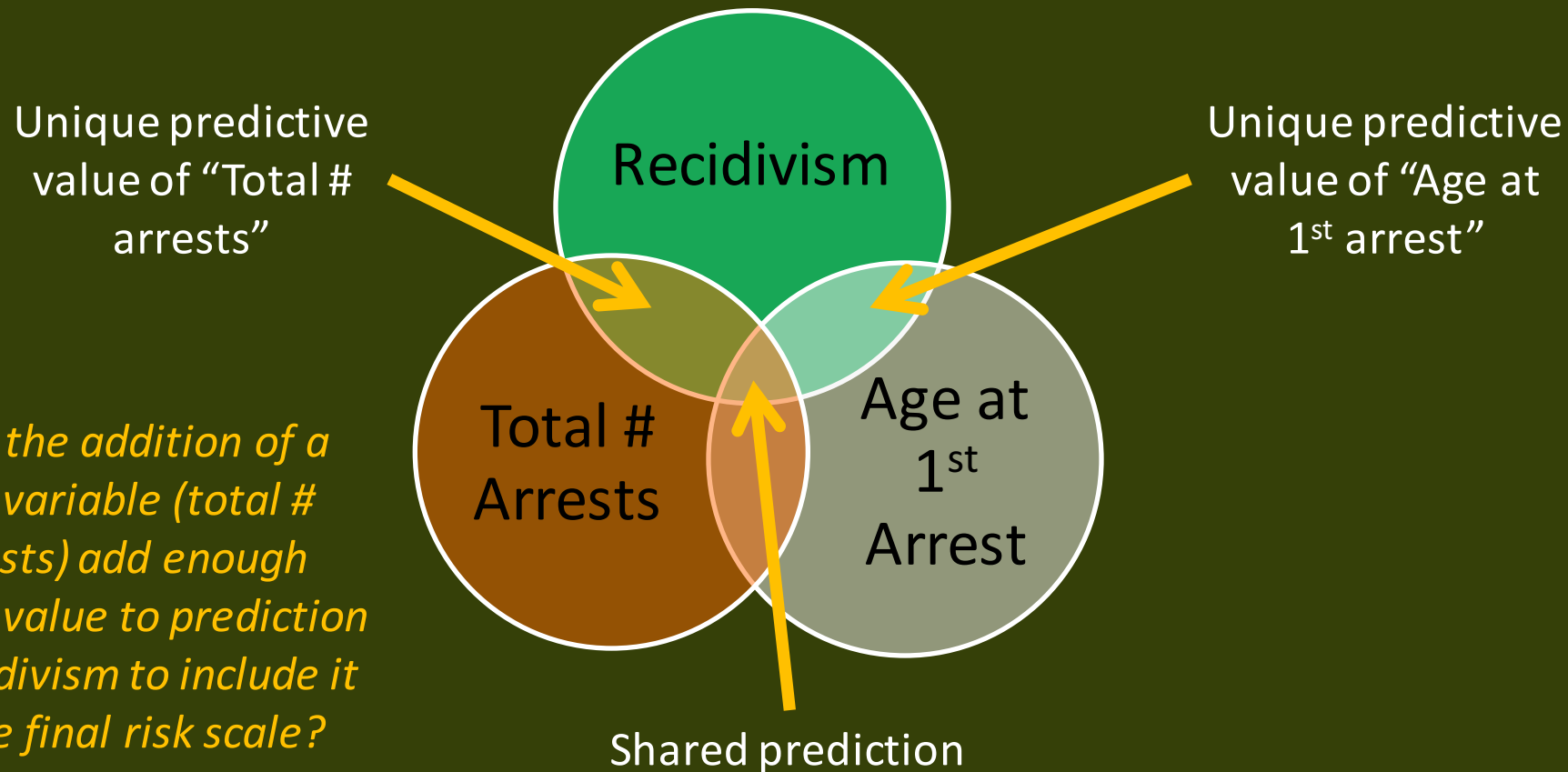


- Categorical analysis →

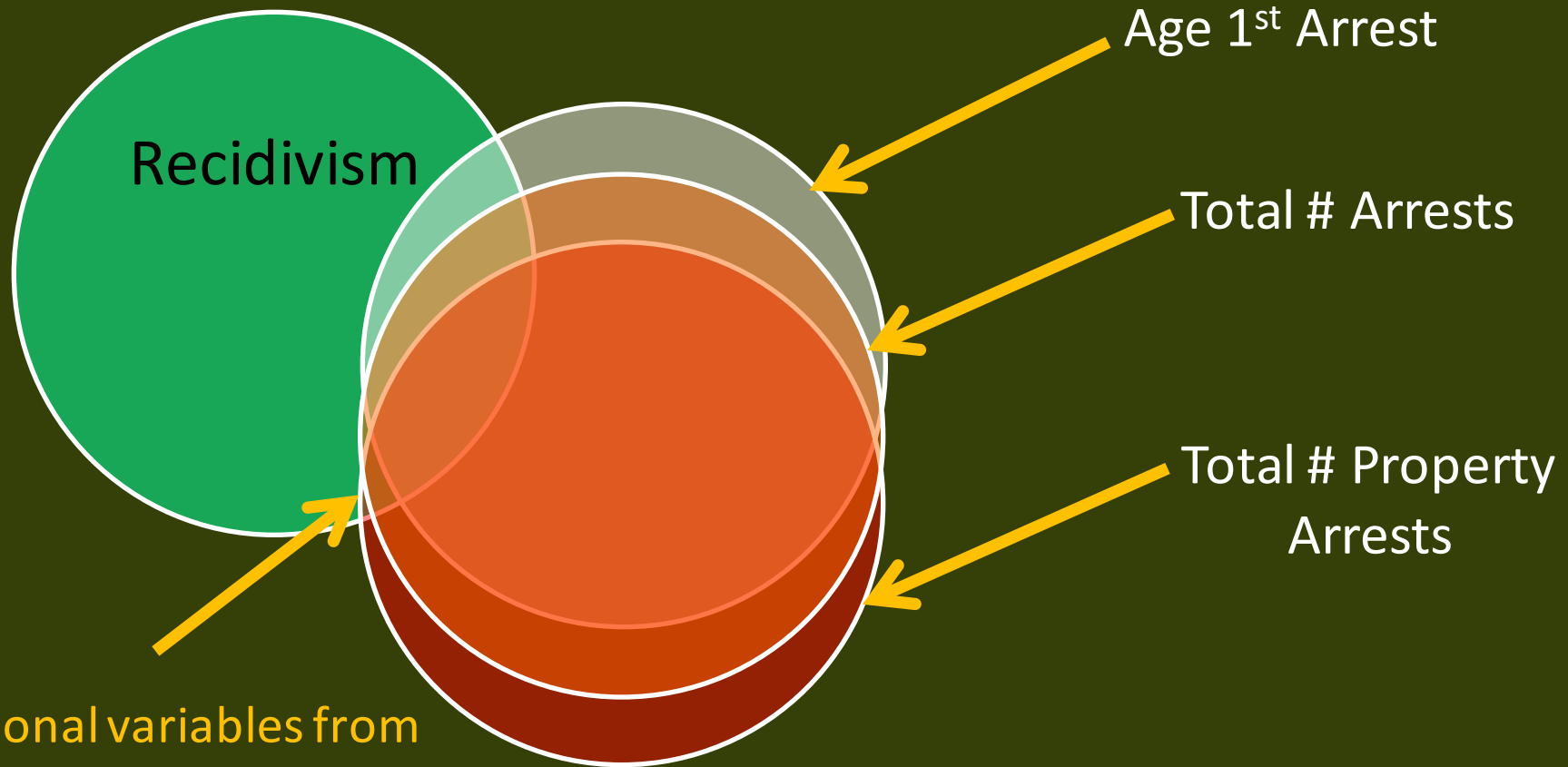


How Are Actuarial Risk Scales Developed?

7. Combine individual risk factors to obtain most **efficient** and **robust** prediction of targeted outcome



How Are Actuarial Risk Scales Developed?



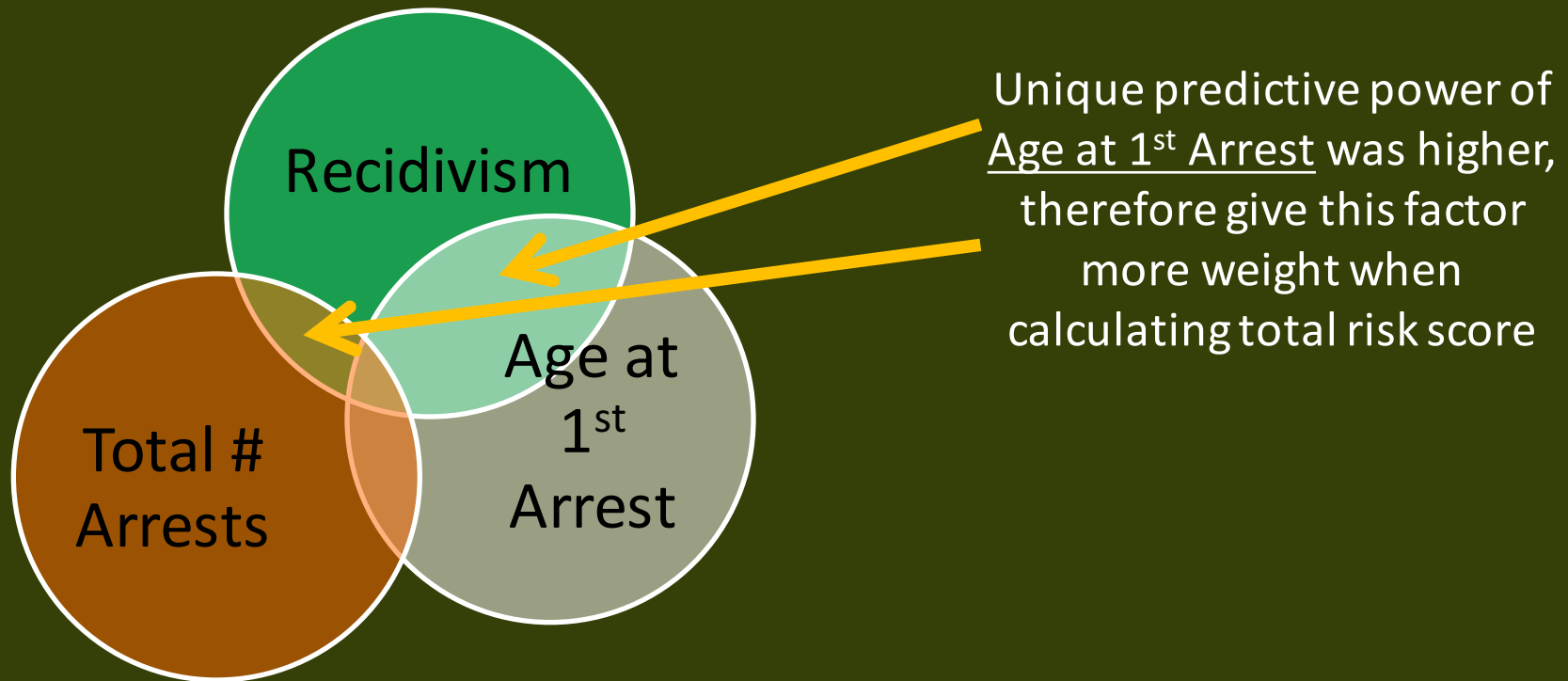
Additional variables from same data system (e.g., LEDS) provides limited incremental benefit after a certain point



Search for risk factors in other domains, datasets

How Are Actuarial Risk Scales Developed?

8. Identify items weights (often but not always done)



9. Calculate total risk score for each case by adding up points/weights

How Are Actuarial Risk Scales Developed?

10. Create cutoffs for risk groups/classifications using distribution of scores in developmental sample
 - There is no universally accepted threshold for determining “Low”, “Medium”, or “High” risk

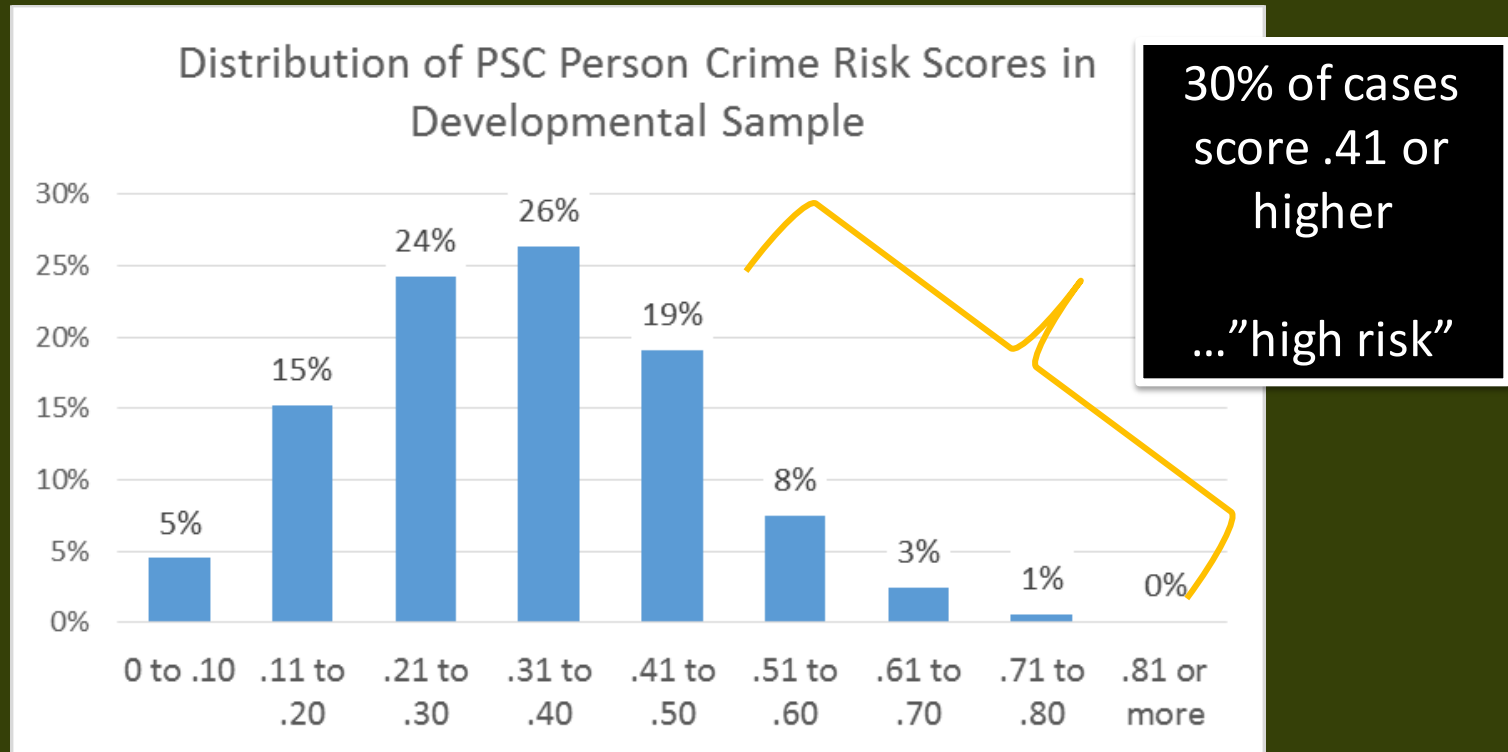


10% chance of recidivating?
50% chance of recidivating?

- Depends on behavior being predicted (e.g., new violent offense vs. property offense) and who is interpreting the risk (e.g., prosecutor vs. victim)

How Are Actuarial Risk Scales Developed?

10. Create cutoffs for risk groups/classifications using distribution of scores in developmental sample
 - Capacity-based cutoffs



How Are Actuarial Risk Scales Developed?

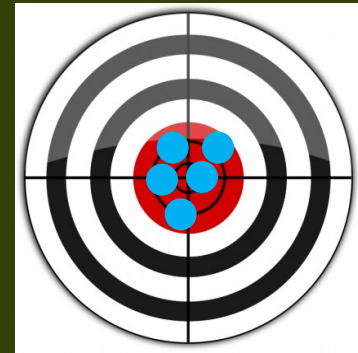
11. Implement scale by applying to new cases

- *“Sixty-two percent of the people in the PSC’s developmental sample with a similar demographic and criminal history profile recidivated with a new person crime within 5 years.”*
- *“This offender’s score on the PSC places him in the DOC’s ‘high risk’ category.”*

How Do You Choose a Risk Scale for Your Agency?

- **Ease of use** – risk scales that are complicated, costly, and time consuming are rarely adopted/sustained
- **Reliability** – similar risk scores should be produced by different raters

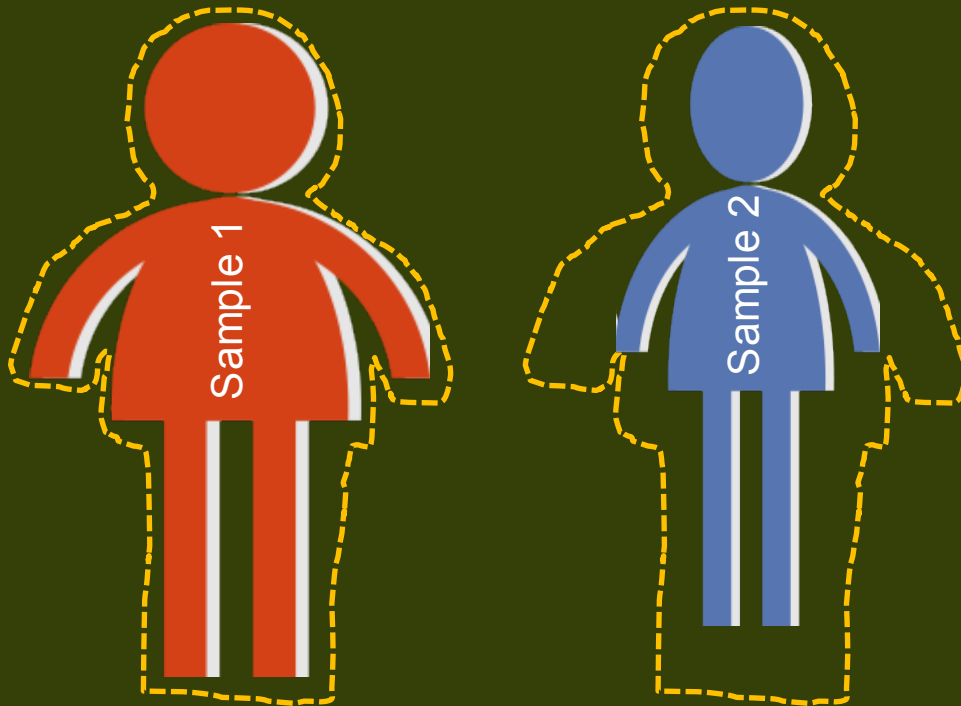
Reliability of a scale places limits on accuracy



How Do You Choose a Risk Scale for Your Agency?

- **Similarity of Target Population** – select a scale that was designed for a similar population of cases

Shrinkage



How Do You Choose a Risk Scale for Your Agency?

- **Predictive accuracy** – select a scale that has strong predictive validity

- **Correlation** - PSC & new person crimes = **.29**

“PSC scores predict recidivism at a statistically significant level, a level that exceeds random chance”

- **ROC & AUC** - PSC & new person crime = **.70**

*“There is a **70%** chance that a randomly selected recidivist would have a higher PSC score than a randomly selected non-recidivist”*

How Do You Choose a Risk Scale for Your Agency?

- **Predictive accuracy** – how do you interpret the magnitude of the effect size

	<i>r</i>	<i>AUC</i>
Small	.10	.56
Medium	.24	.64
Large	.37	.71

Rice & Harris (2005)

How Do You Choose a Risk Scale for Your Agency?

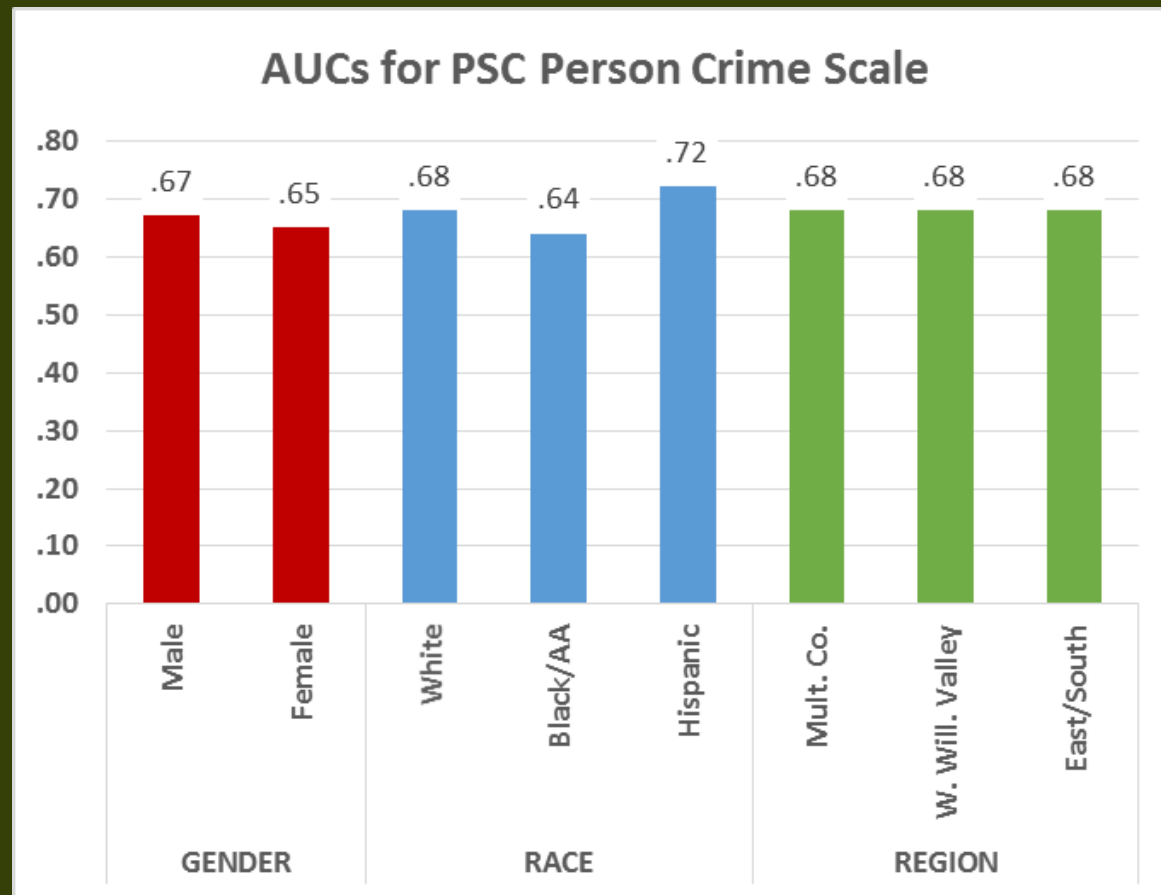
- **Predictive accuracy** – select a scale that has strong predictive validity: **compared to other scales**

Violence Risk Scales	AUC
Historical, Clinical, and Risk Management (HCR-20)	.71
Risk Matrix 2000 for Violence (RM2000V)	.70
Public Safety Checklist - Person Crimes	.70
Violence Risk Appraisal Guide (VRAG)	.68
General Statistical Infor. for Recidivism (GSIR)	.68
Level of Service Inventory (LSI/LSI-R)	.65
Violence Risk Scale (VRS)	.65

AUC's for other scales from Yang, Wong, & Coid's (2010) meta-analysis on violence prediction

How Do You Choose a Risk Scale for Your Agency?

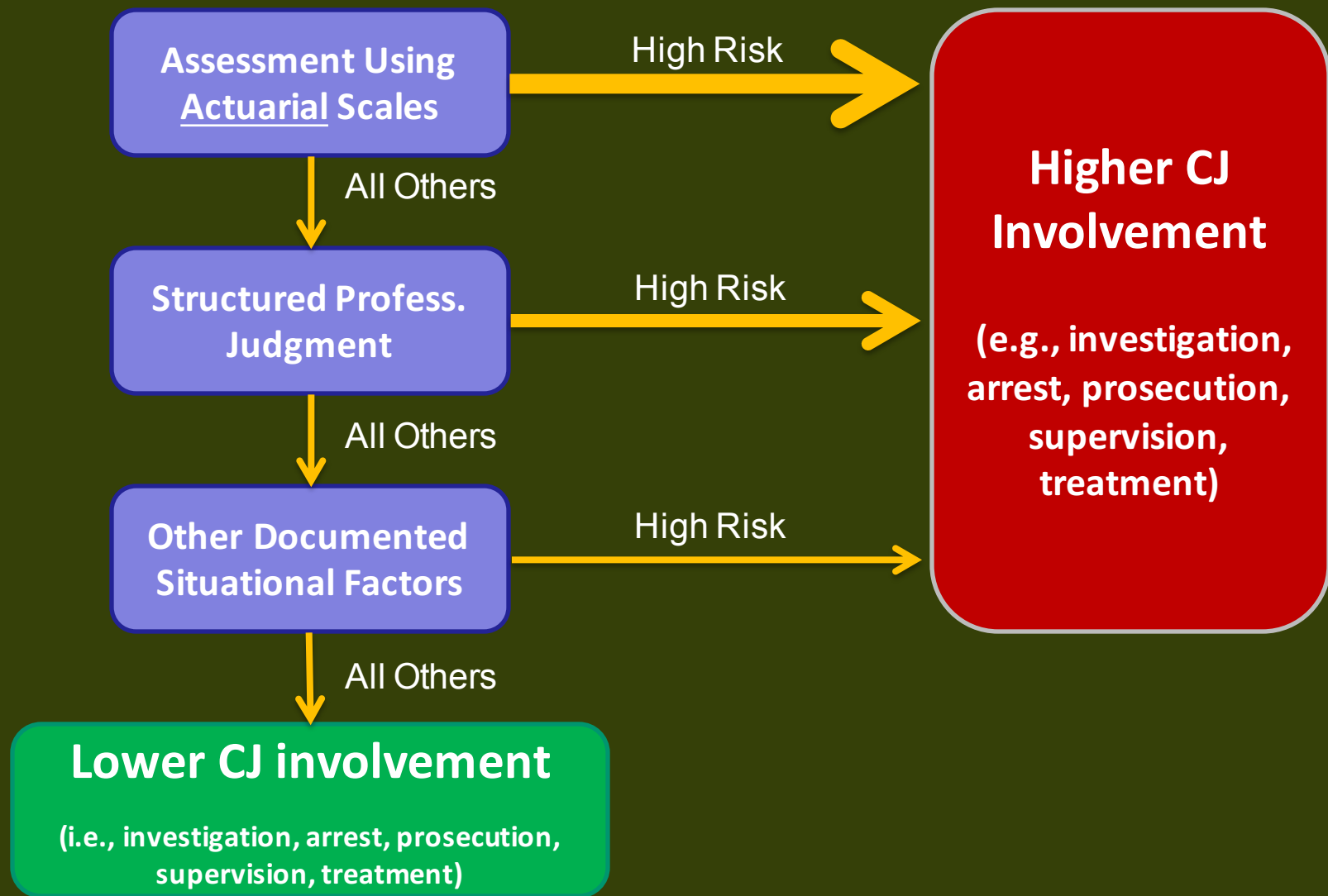
- **Accuracy by groups** – select scale that predicts comparably for different demographic groups



How Do You Choose a Risk Scale for Your Agency?

- **Recognize limitations** – Actuarial scale like the PSC may miss obvious concerns like a person who:
 - Has a detailed fantasies involving killing a 15-year old neighbor & burying her body in back yard
 - Increasing addiction to heroin
 - Recent loss of job and bankruptcy
 - Re-acquaintance with former gang members
 - Escalating marital conflict

How Do You Choose a Risk Scale for Your Agency?



Scales to Consider...

Risk Instruments		Risk/Needs Assessments	
TOOL	OUTCOME	TOOL	OUTCOME
Static-99	Sexual recidivism	LS/CMI	General recidivism
ODARA	DV offenses	COMPAS	General recidivism
PSC	Person crimes	ORAS	General recidivism
VRAG	Violent crimes	STRONG-R	General recidivism
VPTRA	Failure to appear		

- Agencies can also develop scales to predict outcomes of interest using their own records

Contact Information

Kris Henning, Ph.D.
Chair and Professor
khenning@pdx.edu

Ryan M. Labrecque, Ph.D.
Assistant Professor
rml@pdx.edu

Criminology and Criminal Justice Department
Portland State University